Document ID:PLN-627
Revision ID:1
Effective Date:04/08/02

Plan

Quality Program Plan for the High Level Waste Program Office

Prepared for:
U.S. Department of Energy
Idaho Operations Office
Idaho Falls, Idaho

Idaho National Engineering
and Environmental Laboratory

Form 412.14
07/24/2001
Rev. 03

Plan High Level Waste	**QUALITY PROGRAM PLAN FOR THE HIGH LEVEL WASTE PROGRAM OFFICE**	Identifier: Revision: Page:	PLN-627 1 i of vi
Document Control Center: (208) 526-1202	Document Owner: High Level Waste Program Office	~~Effective~~ Date:	04/08/02

Change Number: 89385
Entire Document Revised

Document Type: Quality Program Plan — Document Identifier: PLN-627

Title: Quality Program Plan For The High Level Waste Program Office

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CONTENTS

FIGURES

ACRONYMS

ASME	American Society of Mechanical Engineers
BBWI	Bechtel BWXT Idaho, LLC
CFR	Code of Federal Regulations
DAR	Document Action Request
DMCS	Document Management Control System
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
EM	Environmental Management
EPA	Environmental Protection Agency
ESH&QA	Environment, Safety, Health, and Quality Assurance
GDE	Guide
HEPA	High Efficiency Particulate Air
HLLW	High Level Liquid Waste
HLW	High Level Waste
ICPP	Idaho Chemical Processing Plant
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
M&O	Managing and Operating [Contractor]
MCP	Management Control Procedure
NDE	Nondestructive Examination
NGLW	Newly Generated Liquid Waste
NON	Notice of Noncompliance
NQA-1-1997	American Society of Mechanical Engineers Quality Assurance Requirements for Nuclear Facility Applications, 1997 Edition

NWCF	New Waste Calcining Facility
NUREG	Nuclear Regulation
OCRWM	Office of Civilian Radioactive Waste Management
PDD	Program Description Document
PLN	Plan
POL	Policy
PRD	Program Requirements Document
QA	Quality Assurance
QAP	Quality Assurance Program
QARD	Quality Assurance Requirements and Description (DOE/RW-0333P)
Q-List	Quality Level List
QPP	Quality Program Plan
RW	Radioactive Waste
SAD	Site Area Director
SBW	Sodium Bearing Waste
SNF	Spent Nuclear Fuel
SSCs	Systems, Structures, and Components
STD	Standard
STP	Site Treatment Plan
TFF	(INTEC) Tank Farm Facility
TPR	Technical Procedure

BACKGROUND

The Idaho National Engineering and Environmental Laboratory (INEEL) High Level Waste (HLW) Program Office was formed in 1996. The INEEL High Level Waste Program is responsible for managing, treating, storing, and disposing of the Department of Energy's (DOE) radioactive liquid waste, high level solid (calcine) waste, contaminated mixed debris, and high efficiency particulate air (HEPA) filters stored at the Idaho Nuclear Technology and Engineering Center (INTEC). The HLW Program Office's mission is to address this need through strategic planning and program execution in accordance with legal and regulatory requirements. Program activities include planning, scheduling and execution of technology development projects and INTEC waste storage and treatment activities to comply with DOE Orders, the Site Treatment Plan (STP), the Notice of Noncompliance (NON) [Docket No. 1090-1-24-6601], Consent Order, the Settlement Agreement, [CV-91-0065-S-EJL (D.ID)] (October, 1995).

High Level Waste (HLW) has been generated since 1952 using facilities located at the INTEC (formerly the Idaho Chemical Processing Plant or ICPP). Spent nuclear fuel (SNF) was brought to INTEC from a variety of reactors throughout the world and was stored either under water in pools or in dry storage facilities for an interim period. Some of the SNF was chemically reprocessed to recover uranium, lanthanum, neptunium, and krypton for the DOE and its predecessor organizations. This reprocessing produced Highly Radioactive Liquid Wastes, generally referred to as High Level Liquid Waste (HLLW) which was stored in the INTEC Tank Farm Facility. Since 1963, this HLLW has been solidified using a process called calcination. The last of the HLLW was calcined in 1998. The calcine solids are stored in specially designed cylindrical stainless steel storage containers surrounded by concrete. The stainless containers and surrounding concrete are generally referred to as "bin sets" and have a design life of 500 years. During this same time, other radioactive liquid wastes were generated that were not associated with SNF reprocessing. These other liquid wastes are primarily decontamination and other operational waste streams containing Sodium solutions. These are generally referred to as Soduim Bearing Wastes (SBW). Although the sodium bearing waste is stored and treated in the same manner as the HLLW, it is actually a mixed transuranic waste. Separate from SBW are Newly generated liquid waste (NGLW) streams including those at INTEC from the fuel storage basins, water runoff, evaporation and off-gas cleanup operations, analytical laboratories, New Waste Calcining Facility (NWCF) decon shop and those from other INEEL locations. Theses NGLW waste streams will be treated and stored separately from the SBW currently stored in the tank farm to minimize the amount of [radioactive solid] waste added to the tanks. In addition to Liquid Waste, other types of wastes such as contaminated job wastes, (tools, clothing, laboratory utensils, etc.) have been generated.

In April 1992, DOE announced that spent fuel would no longer be reprocessed and called for a shutdown of the reprocessing facilities at the INTEC. Since that time, no additional *reprocessing* waste has been (or is planned to be) generated. The generation of sodium bearing waste is dependent on how much and what type of work is done at INTEC in the future. Approximately 5000 cubic meters of liquid sodium bearing waste is currently stored in the INTEC Tank Farm and 4300 cubic meters of calcine is stored in the INTEC bin sets.

1. PURPOSE AND SCOPE

1.1 Purpose

Per Management Control Procedure, MCP-561, *Quality Program Plan/Quality Assurance Project Plan Development*, the purpose of a Quality Program Plan (QPP) is to identify the need for a program or project to depart from the requirements of the Company Quality Assurance Program (QAP) for any reason other than an element not being within the scope of the program or project, or to identify any unique or special customer quality assurance requirements that are not addressed in the company QAP. This QPP fits the format of MCP-561, Appendix A and documents and describes the High Level Waste Program Office implementation of the Company's Quality Assurance Program (QAP). **This QPP does not depart from the Company QA program, (see manual 13A), HOWEVER, it does allow the use of applicable Spent Nuclear Fuel implementing procedures, which references MCP-38, *Selection, Indoctrination, Training, and Qualification of Personnel Performing INEEL SNF Program Quality Affecting Work*, without HLW personnel being trained/qualified/certified to DOE/RW-0333P**. This QPP also identifies outside stakeholder requirements (waste acceptance criteria) and identifies specific QA requirements imposed by DOE Order 435.1, and its Implementation Manual and Guide. This QPP also describes the strategy for implementing those specific requirements.

1.2 Scope

The scope of this QPP includes the following HLW Program activities.

- Waste Incidental to Reprocessing
- Sodium Bearing Waste treatment and disposition
- TFF Tank Closure
- Calcine treatment and disposition
- Technical Development.

Future HLW activities, not yet known at this time, may be applicable and will be included as appropriate.

Conduct of Operations for facilities and processes are not included in this QPP.

HLW activities for which Environmental Protection Agency (EPA) quality assurance requirements apply are addressed by MCP-5093, *Management of Environmental Data* and MCP-561, Section 4.2, Quality Assurance Project Plans (QAPjP)'s and Appendix B. A QAPjP may be generated as a stand alone document or, as permitted by EPA QA/R-5 (*EPA Requirements for Quality Assurance Project Plans)* and EPA QA/G-5, (*EPA Guidance for Quality Assurance Plans)* as contained within a sampling and analysis

plan, program plan, or a waste analysis plan. EPA Data Quality Objectives shall be per EPA QA/G-4 (*EPA Guidance for the Data Quality Objectives Process)*.[a]

The Company utilizes MCP-540, *Documenting the Safety Category of Structures, Systems, and Components* for establishing a graded approach. The graded approach is comprised of a four level classification system based on safety and hazards analysis. The levels, from high to low are: Safety Class, Safety Significant, Low Safety Consequence, and Consumer Grade. The graded application of the QA requirements is consistent with the safety impact of an activity, process, or an item, on the workers, the public, and the environment. Quality assurance controls are applied to the degree commensurate with the:

- Regulatory Requirements
- Applicable Codes and Standards
- Function or end use of the item
- Consequence of failure (risk) of the item
- Importance of the data being collected or analyzed
- Complexity of design or fabrication of the item or design or implementation of the activity
- Reliability of the process
- Reproducibility of the results
- Uniqueness of the item or degree of standardization
- History of the item or service quality
- Necessity of special controls or processes
- Degree to which functional compliance can be demonstrated through inspection or test

Applicable Company implementing procedures, (i.e., Management Control Procedure [MCPs], PLANs [PLNs], Technical Procedure Requirements [TPRs]) are used to facilitate the implementation this QPP. Items and activities within the HLW Program **Office** do not require the development of a Q-list as specified in MCP-540. **Projects and field activities** associated with the mission of the HLW Program may require the development of a Q-List as part of that specific effort. Consumer Grade items, which are exempt from a Q-list, present a negligible risk to public or worker safety, or the environment, and are managed using national standards or best management practice principles.

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a. The inclusion of EPA QA/R-5, G-5, and G-4 as reference drivers is based on Company interpretations of applicable environmental requirements. See MCP-5093 and MCP-561, Appendix C.

In the event that the INEEL HLW Program Office is directed to perform work that requires Quality Assurance controls not currently identified in this Plan, this plan will be revised via Document Action Request.

Quality Assurance Records generated by this QPP will be handled in accordance with PLN-727 *Records Management Plan for the High Level Waste Program.*

1.3 Codes, Standards and Regulations

The basis for this QPP is the Company's QA Program, (Manual 13A) and MCP-561, *Quality Program Plan/Quality Assurance Project Plan Development.* Additional quality requirements / guidance / clarification are imposed by DOE Order 435.1, supported by the Implementation Manual and Guide. Stakeholder waste acceptance criteria are imposed by the Waste Isolation Pilot Plant, Waste Acceptance Criteria (WIPP/WAC) and the Waste Acceptance System Requirements Document (WASRD) of Yucca Mountain.

Applicable portions of the following Codes, Standards and Regulations are implemented by this plan:

- 10 CFR 830.120, *Quality Assurance Requirements*
- Price-Anderson Amendments Act *(PAAA)*
- DOE Order 435.1, *Radioactive Waste Management*
- DOE M 435.1-1, *Radioactive Waste Management Manual*
- DOE G 435.1-1, *Implementation Guide for use with DOE M 435.1-1*
- WIPP/WAC, *Waste Isolation Pilot Plant Waste Acceptance Criteria*
- (Yucca Mt.) WASRD, *Waste Acceptance System Requirements Document*
- EPA QA/R-5, *EPA Requirements for Quality Assurance Project Plans*
- EPA QA/G-5, *EPA Guidance for Quality Assurance Plans*
- EPA QA/G-4, *EPA Guidance for the Data Quality Objectives Process*
- [DOE] ID 0 435.A, *Waste Incidental to Reprocessing*

1.4 Implementation

This QPP is implemented in accordance with the company's QA Program through Company implementing procedures. There are several documents listed in Section 1.3 above that provide guidance, clarification or additional requirements.

DOE O 435.1, delineated by way of the supporting Implementation Manual and Guide, provides additional requirements. Per DOE Guide 435.1-1, Chapter II, Section G. Subsection (1). "The requirements of DOE/RW-0333P, Quality Assurance Requirements and Description, shall apply to those high-level waste items and activities important to waste acceptance/product quality."

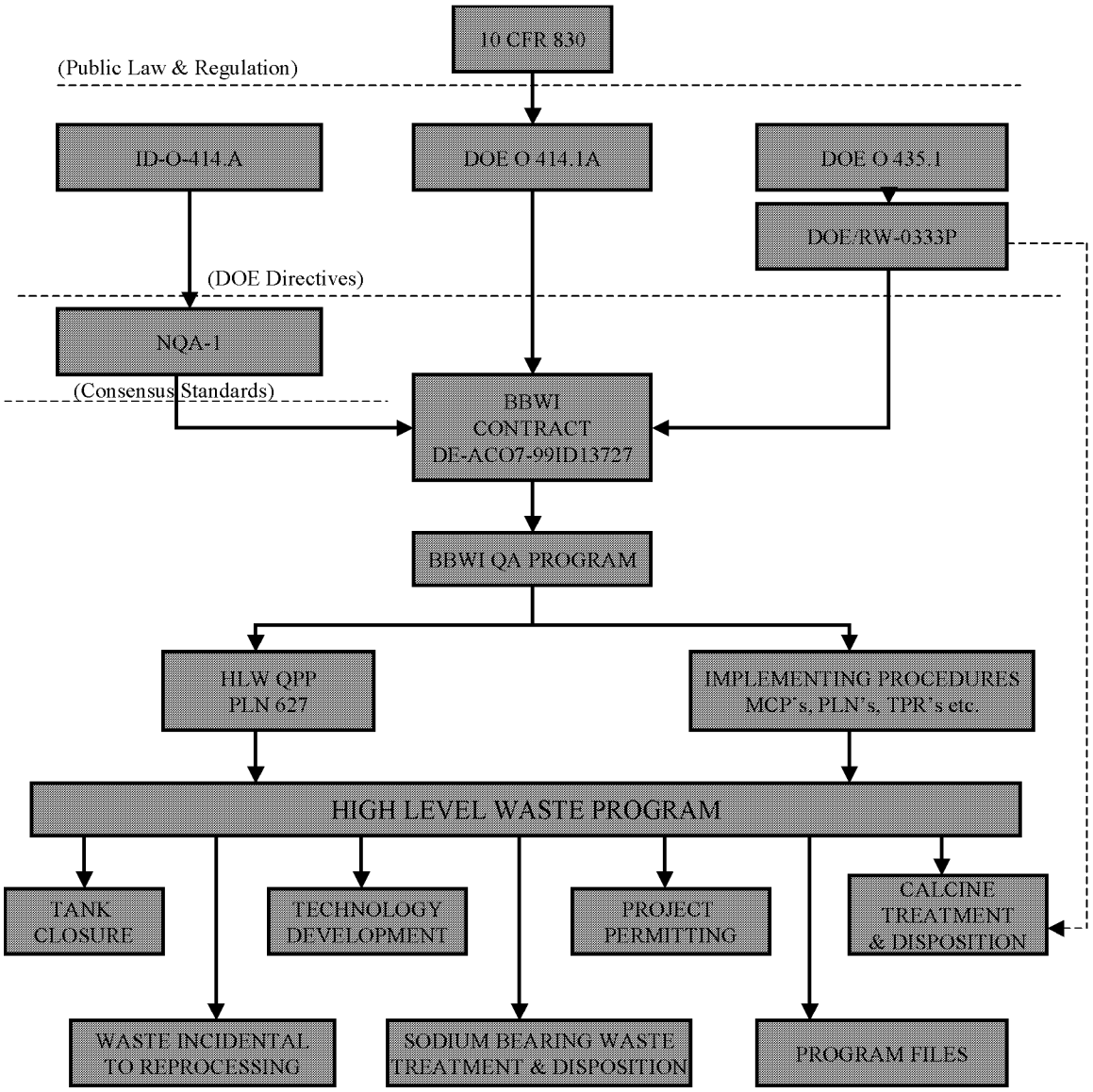


Figure 1. HLW requirements and implementation flow diagram.

In addition, DOE G 435.1-1, Chapter II G (2) requires: "The evaluation and assessment requirements of DOE/RW-0333P *Quality Assurance Requirements and Description*, (QARD) and associated implementing procedures shall be met for high-level waste acceptance and product quality activities, in addition to the assessment requirements of other DOE directives and requirements identified in Chapter I of this Manual."

Within the discussion portion of DOE G 435.1-1, Chapter II, Section G, additional detail is given by stating that "---the QARD applies to the following high-level waste activities: acceptance; transport and; high-level waste form development through qualification, production, and acceptance."

As used above, the term "high-level waste" has a specific definition and refers to a type of waste stream and not to the HLW Program as a whole. (see Definitions, Section 1.8)

DOE Manual and Guide 435.1-1 has identified certain waste streams, broadly defined as "high level waste" due to the source of generation, that are actually Waste Incidental to Reprocessing and can be managed in accordance with DOE M 435.1-1, as either transuranic (TRU) or low level waste (LLW).

1.5 QPP Change Control

This QPP is a controlled document issued by the INEEL Document Management Control System (DMCS), and has been assigned a unique identification number. The initial reviews and approvals and subsequent revisions are documented on Form 412.11 *Document Action Request* (DAR), and the review/approval sheet at the front of this QPP (Form 412.15). Revisions require the same level of review and approvals as required for the original release.

1.6 Organizational Responsibilities

(The organizational structure for HLW work covered by this QPP is depicted in Figure 2.)

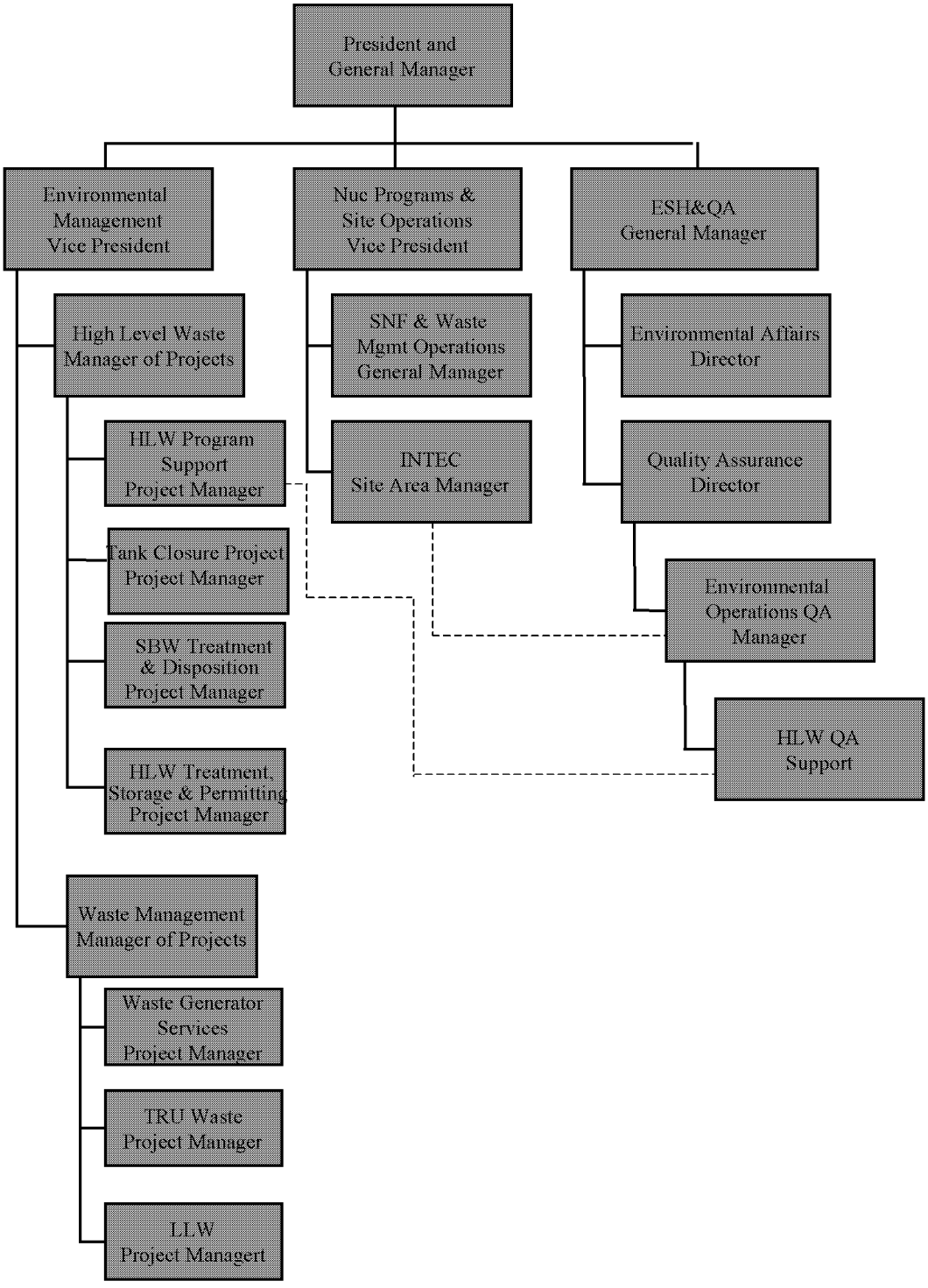
1.6.1 HLW Quality Assurance Responsibilities

THE RESPONSIBILITY FOR ACHIEVING QUALITY IS ASSIGNED TO THOSE INDIVIDUALS OR ORGANIZATIONS PERFORMING QUALITY AFFECTING WORK. (As addressed in Manual 13A)

Quality affecting work may be delegated, however the delegating organization is responsible for the quality of the work.

1.6.2 President, General Manager and Laboratory Director

The President, General Manager and Laboratory Director is responsible for overall management of contractor activities and is accountable for complying with the INEEL M&O contract conditions including development of an M&O quality assurance program. The General Manager is ultimately responsible to DOE-ID for ensuring the WIR determination has been developed in accordance with all applicable requirements and the information is true, accurate, and complete.



------ represents Matrixed Personnel

Figure 2. High Level Waste organization chart.

1.6.3 Vice President, Environmental Management Programs

The Vice President, Environmental Management Programs is responsible for ensuring integration of HLW Program activities with other INEEL Waste Management Programs, including Waste Generator Services (WGS) Program and the TRU Waste Program, as appropriate.

1.6.4 Manager of Projects, High Level Waste Program

The Manager of Projects, High Level Waste Program, ensures that cost-effective and fully compliant nuclear operations programs are in place and operating at the INEEL. He also has the authority, responsibility, and accountability for establishing and maintaining the necessary programs and procedures to ensure consistent implementation of the WIR determination process and development of specific WIR determination reports.

1.6.5 Manager of Projects, Waste Management Program

The Manager of Projects, Waste Management Program is responsible to manage and transport waste effectively, ensure development of waste management technologies, and ensure program execution.

1.6.6 General Manager, Spent Nuclear Fuels and Waste Management Operations

The GM, SNF and Waste Management Operations is responsible to ensure that HLW policy is carried out and for the operational integration and consistent execution of operational activities.

1.6.7 Site Area Director, Idaho Nuclear Technology and Engineering Center

The INTEC SAD is responsible for all INTEC HLW operations activities and for review and concurrence of WIR determinations that have been developed for INTEC facilities.

1.6.8 General Manager, Environmental Safety, Health and Quality Assurance

The GM, ESH&QA is responsible to: ensure ESH&QA work is performed in a compliant manner, manage processes to ensure compliance with ESH&QA contract and regulatory requirements, interpret and establish ESH&QA requirements, and provide independent oversight for ESH&QA activities.

1.6.8.1 Director, Quality Assurance

The Director, Quality Assurance, who reports to the General Manager for ESH&QA is responsible for the company-level QA program and for independent assessment of the QA program and its implementation.

1.6.8.2 QA Manager, Environmental Operations

The QA Manager, Environmental Operations is responsible for implementing the applicable INTEC Operations Quality Program Plan(s), providing quality assurance guidance to the INTEC SAD, and interpreting QA Program requirements as they apply to the HLW Program activities at INTEC. The Environmental Operations QA Manager has access to senior HLW Program management and through the General Manager, ESH&QA for resolution of quality issues.

1.6.8.3 QA Lead, HLW Program

Through the delegated responsibility derived from the GM, ESH&QA, Director, QA and the HLW Program Office the QA Lead establishes and maintains the HLW Program Office Quality Program, provides quality assurance guidance to the HLW Program Office, and interprets QA program requirements as they apply to the HLW Program Office. The INEEL QA Organization is required to review the initial issue and all subsequent revisions to this QPP.

1.7 Prerequisites

Job codes shall be established for personnel matrixed to HLW. Individual Training Plans shall reflect training requirements commensurate to the job code. Company support organizations performing work for the HLW Program shall have any required training identified in a Task Baseline Agreement (TBA), Scope of Work (SOW), transmittal document or other form of conveyance between the HLW Program and the performing organization.

1.8 Definitions

High Level Waste (HLW) ---Waste generated directly as a result of spent nuclear fuel reprocessing.

Waste Incidental to Reprocessing ---Waste resulting from reprocessing spent nuclear fuel that is determined to be incidental to reprocessing is not high-level waste, and shall be managed under DOE's regulatory authority in accordance with the requirements for transuranic waste or low-level waste, as appropriate.

1.9 References

DOE/ID-10802, Idaho Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for Idaho Nuclear Technology and Engineering center Tanks WM-182 and WM-183.

DOE/ID-10841, Contingent Landfill Closure and Post/Closure Plan for Idaho Nuclear Technology and Engineering Center Tanks WM-182 and WM-183.

INEEL/EXT-01-01543, Sampling and Analysis Plan for the Post-Decontamination Characterization of the Process Waste Lines from INTEC Tank Farm Facility Tanks WM-182 and M-183.

INEEL/EXT-01-00666, Sampling and Analysis Plan for the Post-Decontamination Characterization of the WM-182 and WM-183 Tank Residuals.

Also, see Sections 1.3 above and 2 below.

1.10 Records

Documents generated and identified by the Program to be records shall be managed in accordance with PLN-727, *Records Management Plan for the High Level Waste Program*. Documents generated by supporting organizations that are identified as records shall be managed in accordance with applicable implementing procedures established by the supporting organization.

2. ASSOCIATED PROGRAM DOCUMENTS

High Level Waste Strategic Plan (PLN 575)

Strategic goals of PLN-575 are to meet the Settlement Agreement which requires: 1. treatment of sodium bearing waste and cease use of existing waste tanks by 2012; 2, treatment of high level waste so that it can be moved out of Idaho for disposal by 2035; and 3. Maintenance of facilities and ongoing activities such as liquid waste management, and Resource Conservation and Recovery Act (RCRA) closures.

Program Description Document for INEEL High Level Waste Program (PDD-10)

This Program Description Document describes the INEEL HLW Program of the M&O contractor. It delineates the overall INEEL HLW Program and identifies management responsibilities required to achieve administrative, regulatory, and mission success. It also provides a summary of management controls including quality assurance controls.

Bechtel BWXT Idaho, LLC, *Quality Assurance Program Requirements Document (QA PRD)* (see Manual: 13A-Quality and Requirements Management Program Documents.

Project Execution Plan for RCRA/DOE Tank Closure Project

The Project Execution Plan (PEP) for the Tank Closure Project is an internal project document. It is not found in the Document Management Control System (DCMS). For a copy of the document, contact the Project Manager or the individual in charge of the HLW Central File Location.

Project Execution Plan (PEP) for Sodium Bearing Waste Treatment and Disposition

PEP has not been written yet.

Project Execution Plan (PEP) for Calcine Treatment and Disposition

PEP has not been written yet.

3. QUALITY PROGRAM ELEMENTS

The High Level Waste Program does not depart from the Company Quality Assurance Program, however, it does allow the use of certain SNF implementing procedures, (i.e. MCP-3041, *Electronic Data Management System Control* and MCP-3042, *Scientific Investigation,* etc.) without HLW personnel being 0333P qualified in accordance with MCP-38.

SNF implementing procedures should be used only after careful review of scope of applicability, "source requirements" and "drivers". This is to avoid Nuclear Regulatory Commission (NRC) "drivers" for non-NRC activities.

The 18 criteria of NQA-1, plus **Software Quality** Control and **Management of Environmental Data** are addressed in the 20 sections of Manual 13A. These requirements are not reproduced here, but can be found in Company Manual 13A, *Quality and Requirements*. Controlled copies are available in the DMCS.

DOE, via applicable DOE Orders, Manuals and Guides has imposed several special QA requirements relevant to specific HLW activities. DOE Order 435.1 requires that DOE/RW 0333P *Quality Assurance Requirements and Description* be applied to "---those high-level waste items and activities important to waste acceptance/product quality and to audits and assessments." The HLW Program will apply 0333P at the appropriate time to comply with the DOE Order, however, it is anticipated this will be several years in the future. The Company QA Program presently addresses and complies with 0333P for Spent Nuclear Fuel activities. When HLW activities progress to the point that waste acceptance/product quality are being affected, the applicable criteria of DOE/RW-0333P will be applied.

DOE Order 435.1, *Radioactive Waste Management*, supported by Manual DOE M 435.1-1, and Guide DOE G 435.1-1 delineate specific requirements applicable to certain types of waste streams. These waste streams, meeting specific criteria, are allowed to be re-classified as Waste Incidental to Reprocessing (WIR). The specific requirements are identified in M 435.1-1, Chapter II, Section B and in G 435.1-1. Additional guidance is provided to the M&O via ID Order 435.A, *Waste Incidental to Reprocessing*, which incorporates into the Contractor Requirements Document, the requirement to establish and maintain a formal process to initiate, develop, review and approve WIR determinations. This is formalized in PLN-1036 entitled, *Performing Waste Incidental to Reprocessing Determinations*. ID O 435.A also requires that "The Idaho Operations Office (ID) shall concur with all substantive changes to implementing plans and procedures."

4. APPENDICES

4.1 Implementing Document Matrix

(Appendix not required) See LST-200 (LIST) for a reference to the principal documents that are currently used to implement the INEEL Quality Assurance Program. This list is not all inclusive and does not limit the HLW Program from utilizing additional approved Company implementing procedures. Implementing procedures written specifically for the Spent Nuclear Fuel Program, such as MCP-3041, *Electronic Data Management System Control,* and MCP-3042, *Scientific Investigation* may be utilized by HLW, however, the requirement to be 0333P trained and certified is not applicable. HLW is not required to implement 0333P at the present time.

4.2 Implementing Document Titles

(Appendix not required) See list 200 for implementing document titles.

4.3 List of Impacted Facilities/Sites

(Appendix not required) This QPP is applicable to HLW Program activities and does not include site facilities.

4.4 List of support Organizations

(Appendix not required) The HLW Program is supported, in part, by the organizations listed in Section 1.6. Other company support organizations may be utilized as needed. See Section 1.7 for additional details.